

100	NUCLEAR FUSION	127	..With injection of electrically charged or accelerated particles
101	..Pellet guidance systems (e.g., pellet injection means)	128	...Plasma injection
102	..Inertial confinement (e.g., nuclear explosive)	129	...Negatively charged particle injection
103	..Photon beam (e.g., laser) irradiation	130	...Neutral particle injection
104	...Optics	131	..Auxiliary heating
105	..Particle beam irradiation (excluding photons)	132	...Electromagnetic wave energy
106	...Ion beam irradiation	133	..Toroidal confinement of plasma
107	..Fusion reaction by plural colliding plasmas or particle beams	134	...Divertors
108	..Including accelerating particles into a stationary or static target (e.g., Cockcroft-Walton generator type)	135	....Effuser
109	..With target replenishing	136	...Limiters or liners
110	..With means for modifying the resultant neutron output, e.g., moderator means	137	...With solid internal conductor
111	..With means to pulsate ion beam	138	...Bumpy torus
112	..Cyclotron type acceleration of nuclei	139	..Linear confinement
113	..With electrostatic voltage generating means	140	...Mirror devices
114	..Self-contained neutron sources (e.g., neutron or accelerator tube)	141	....Plasma formed or contained between spaced electrodes
115	...With cooled electrodes or target	142	..Magnetic structure
116	...With ion beam collimator or filtering structure (e.g., extractor electrode)	143	..With circuitry
117	..With ion beam collimator or filtering structure	144	..Plasma formed between spaced electrodes
118	..Subterranean sources	145	..Plasma focus
119	..With control circuitry	146	..Including removal or use of impurities or reaction products (e.g., energy)
120	..Including bunched particle beam	147	..Direct conversion of energy
121	..Magnetic confinement of plasma	148	..Including use of heat or radiation to effect a chemical reaction
122	..Plasma formed in situ by laser	149	..Shock wave heating of plasma or gas (e.g., MHD heating)
123	..Principal heating by wave energy	150	..Chamber structure or material
124	...Heating by time varying magnetic field (e.g., by compression)	151	..Fusion targets or pellets
125	..Imploding liners	152	..For inertial confinement
126	..With enveloping charged particle confinement (e.g., E or P layer)	153	DETECTION OF RADIATION BY AN INDUCED NUCLEAR REACTION
		154	..By fission
		155	..With boron
		156	NUCLEAR TRANSMUTATION (E.G., BY MEANS OF PARTICLE OR WAVE ENERGY)
		157	..Gamma or charged particle activation analysis
		158	..By neutron bombardment
		159	..Neutron activation analysis
		160	...Subterranean
		161	....Specific nuclides
		162	.....Metals
		163	.....Aluminum, silicon
		164	.....Uranium
		165	.....Hydrogen, chlorine

166	.....Oxygen, carbon	200	...Wherein the reaction product is an actinide or transuranium element
167	....With tracer injection		
168	..Halogens		
169	...Iodine	201	...With reaction product treatment (e.g., recovery, separation)
170	..Actinides		
171	...Breeder or converter reactor structures	202	..Irradiation capsule, holder, or support
172	....Fertile fuel assembly structure or arrangement	203	SEAL ARRANGEMENTS
173	.....Having internal fertile regions	204	..For nozzle
174	....Having particular coolant fluid flow path or pattern within reactor core	205	..Between pressure vessel cover and vessel or portion thereof
175	.....Orifice or fluid control at inlet or outlet of coolant channels	206	..Rotating plug-type cover
176	.....Hydraulic holddown	207	WITH CONTROL OF REACTOR (E.G., CONTROL OF COOLANT FLOW)
177	.....Plural coolant loops or passes through reactor core	208	..Pulsed reactors
178	....Fuel assembly holddown or support	209	..Spectral shift
179	....Coolant manipulated and used exterior of reactor core	210	..By coolant flow
180	...Formation of uranium isotopes	211	..Exterior of core (e.g., secondary loop control)
181	....Uranium 233	212	..By altering quantity of characteristic of fuel within critical area
182	...Formation of plutonium isotopes	213	..Wherein control element includes a fissile material
183	..Doping of semiconductors	214	..Reactor start-up
184	..Rare earths	215	..By electronic signal processing circuitry (e.g., plural redundant circuits)
185	..Alkali and alkaline elements	216	..Plural sensed different conditions or measured variables correlated
186	..Molybdenum, technetium	217	...Control programs
187	..Lead, polonium, bismuth	218	....Xenon control
188	..Sulfur, phosphorus	219	..By movement of control element or by release of neutron absorbing material
189	..With reaction product treatment (e.g., recovery, separation)		
190	..By charged particle bombardment	220	..Wherein the control element is a reflector or moderator material
191	..Alpha-neutron sources		
192	..To produce spallation reactions	221	...Variable fluent reflector/moderator level or density
193	...To produce fissile isotopes	222	....Moderator dump
194	..Proton bombardment	223	..Rotatable control elements
195	...With reaction product treatment (e.g., recovery, separation)	224	..Finger-type control elements (insertable into fuel element positions)
196	..Alpha (helium nucleus) bombardment		
197	...Wherein the reaction product is an actinide or transuranium element	225	...Including shock absorber
198	...With reaction product treatment (e.g., recovery, separation)	226	..Wherein control element is driven directly into bed of fuel elements
199	..Deuteron bombardment	227	..Control element movable by means of cable and winch, chains or reels

228	..Wherein driver or motivating is electric	261	.Fuel component
229	...Electrofluidic	262	..Including handling of a second different, diverse reactor component (e.g., control element, moderator element, vessel cover removal)
230	..Wherein driver or motivating is fluid		
231	...Pneumatic		
232	..By motion transforming means, e.g., rack and pinion	263	...With pressure vessel cover removal
233	..Releasable coupling	264	..Charging or discharging of fuel
234	..Including shock absorber	265	...Refueling ball-type reactors
235	..Means for locking control element in desired position	266	....Means for separating low exposure from high exposure elements
236	..Including control rod insertion and removal schemes		
237	...Group movement of control elements	267	...Refueling schemes, patterns, or fuel cycles (e.g., in/out systems)
238	...Setback	268	.Refueling machines
239	..Rod or support carrying plural elements or diverse materials	269	..With magazine
240	.Sensing or detecting device attached to, embedded in, or integral with control element	270	..With nonaxial transfer capability
241	.Power output control (e.g., load follows with steam dump)	271	..Upper axial transfer
242	..Means to inhibit control rod movement	272	.Storage container systems for new and/or irradiated core elements
243	.With cooling of control element		
244	.Temperature reactivity control	273	SUBTERRANEAN REACTOR STRUCTURES (E.G., UNDERGROUND CONTAINMENT, UNDERGROUND EXPLOSIVE)
245	TESTING, SENSING, MEASURING, OR DETECTING A FISSION REACTOR CONDITION	274	.For minimizing radioactive contamination within an underground chamber or of the material removed therefrom
246	.Flowmeters		
247	.Temperature or pressure measurement	275	.For extracting materials or energy from the earth
248	.Optics	276	..In the form of heated water or steam
249	.Vessel monitoring or inspection		
250	.Leak detection	277	REACTOR PROTECTION OR DAMAGE PREVENTION
251	..Fuel element leak detection		
252	...By acoustic or ultrasonic wave energy	278	.By minimizing positive coolant void coefficient
253	...By the detection of fission products external to the fuel element	279	.Fire extinguishing or prevention
254	.Flux monitoring	280	.Core catchers
255	..Directly generating electrical signal (e.g., ion detection)	281	.Fluid flow reversal protection
256	.Gas sensors (e.g., hydrogen detectors)	282	.Emergency core coolant systems (e.g., injecting coolant into reactor or pipe systems)
257	.Fuel assay (e.g., burnup)	283	.Pressure suppression and relief
258	.Position detection	284	..By fusible means (e.g., ice)
259	.By particular instrumentation circuitry	285	.Expansion means (e.g., shock absorbers, roller bearings)
260	HANDLING OF FISSION REACTOR COMPONENT STRUCTURE WITHIN REACTOR SYSTEM	286	..Pipe expansion joints
		287	.Shield or barrier between radiation or heat source and object to be protected (e.g., insulation, thermal shield)

288	..Particular materials	327	CONTROL COMPONENT FOR A FISSION REACTOR
289	..Thermal insulation		
290	...For liquid metal cooled fast reactors (e.g., insulation for vault roof, or for the vessel walls as by a layer of stagnant or quasi-stagnant coolant)	328	.Liquid control component
		329	..With vaporization
291	...Concentric tubes or conduits with insulation	330	..Liquid metal control component
292	..Concentric tubes or conduits	331	.Gaseous control component
293	..Containment structures	332	.Telescopic control devices
294	...Pressure vessels	333	.Wherein concentration of the reactivity affecting material varies radially or axially of the control element
295	....Concrete	334	..By utilizing a follower
296	....Prestressed	335	.Flexible control element
297	.With turbine protection means (e.g., turbine trip or overspeed protection means)	336	.Fuse actuated devices
		337	..Particulate type
298	.Auxiliary heat removal structure	338	.Particulate type (e.g., balls)
299	..Decay heat removal	339	.Nonconventional control material
300	.Recombiners	340	REACTOR STRUCTURES WITH TESTING OR IRRADIATION FACILITIES
301	..Catalytic		
302	.Core restraint means	341	.With material holder or support positioned outside the radiation source
303	..In-core restraint means	342	.With provision for insertion of material to be irradiated into the radiation means
304	..For moderator structures		
305	.Corrosion or damage prevention	343	..Flux trap reactor structures
306	..By addition of material to coolant	344	..By fluid pressure
307	.With pressurizer means	345	...Wherein the fluid is a liquid
308	FISSION REACTOR MATERIAL (INCLUDING REACTION PRODUCTS) TREATMENT	346	EPI-THERMAL REACTOR STRUCTURES (E.G., INTERMEDIATE NEUTRON SPECTRUM)
		347	REACTOR STRUCTURES
309	.Post accident impurity or contaminant removal	348	.Fast thermal composite core
310	.Impurity removal	349	.Flux flattening
311	..Reprocessing of fuel during reactor operation	350	.Moderator component varies in its effective density or materials
312	..By cold traps or hot traps	351	..Spaced internal reflectors or moderators
313	..By filters, ion exchangers, or absorbers	352	.Orifice or fluid control at inlet or outlet of coolant channels
314	...Gas filters (e.g., adsorbers)	353	.With particular control rod guide structure
315	...Electrostatic or magnetic filters	354	.Fuel material in contact with and supported by fluid
316	..By pressurized fluid (i.e., blowdown)	355	..Fluidized beds
317	COMBINED	356	..Fuel dispersed in liquid moderator, solution, etc.
318	.With propulsion means	357	...Vapor forming, separating, or manipulating
319	..Gaseous core	358	...With particular in situ reconstitution or modification of fuel moderator material
320	.With direct conversion means		
321	..Thermionic		
322	.For storing excess energy		
323	.With chemical reaction		
324	..To produce a combustible fuel		
325	...Cracking of hydrocarbons		
326	.With laser		

359	..Fuel in molten state or in molten vehicle	390	.....With core bypass means (e.g., passage along core barrel or through shield structure)
360	...Fuel in form of fused salt		
361	.Circulating fluid within reactor		
362	..Fuel assembly supports	391	...Manipulated or used exterior of the reactor core
363	...Suspended fuel assembly		
364	...Fuel assembly holddown or locking means	392	....With jet pump
365	....Hydraulic or pneumatic	393	....With coaxial flow
366	..Plural fluids or a fluid in plural phases circulating within reactor (e.g., pressure tube reactors)	394	....With single structure component containment (e.g., pod arrangement)
367	...In heat pipe means		
368	...Including chemically distinct gas	395	..Having specified fluid flow path or pattern within reactor core
369	....With formation, separation, or manipulation of a second gas	396	...Plural separate coolant loops through reactor core
370	...With formation, separation, or manipulation of a vapor (e.g., boiling water reactor (BWR) type)	397	...Plural passes
371	....With vapor-liquid separating means	398	....Re-entrant type
372	....With jet pump	399	...With particular flow directing or diverting means (e.g., flow baffle)
373	....Having specified fluid flow path or pattern within reactor core	400	....With core bypass means (e.g., passage along core barrel or through shield structure)
374	.....Plural separate coolant loops through reactor core	401	...One-fluid-type pressure tube reactor
375	.....With plural, coolant passes through reactor core	402	..Manipulated or used exterior of reactor core
376	.....Re-entrant type	403	...Including tank, pool, or reservoir (e.g., swimming pool)
377	.....With particular flow directing or diverting means (e.g., flow baffle)	404	....Having reactor core and heat exchanger or pump therein
378	....Vapor manipulated or used exterior of reactor core	405	.....With particular heat exchanger structure
379	.....With flow control of fluid within reactor	406	...Compact or integral (e.g., heat exchanger, core, pumps in same vessel)
380	....Nonaqueous vapor	407	...With jet pumps
381	..Pebble bed reactor	408	...With means or structure to flash coolant into vapor
382	...Having core of separate pebble containers	409	FUEL COMPONENT STRUCTURE
383	..Fluid is a gas	410	.With means to prevent thinning of the cladding (e.g., amoeba effect)
384	...Wherein the gas is steam	411	.Spherical particles
385	...Having specified flow path or pattern within reactor core	412	.Encased with nonfuel component
386	....Plural separate loops	413	..With internal pressurizer
387	....Plural passes through core	414	..Coated, preformed, or impregnated layer or part or adhesively bonded layers or parts
388	.....Re-entrant type		
389	....With particular flow directing or diverting means (e.g., flow baffle)	415	...Lubricating layer
		416	...Multiple or composite cladding-type layers

417	....Including getter layer or barrier layer	449	...Having provision or structure for insertion of control elements therein
418	..Getter, fission product retainer of filter	450	.With condition sensing or indicating means
419	..Burnable poison	451	.Having particular end closure or seal (e.g., weld, plug, cap, etc.)
420	..Interpellet spacing or positioning means	452	..With indexing means
421	..Homogeneously intermixed	453	.Fuel support or covering provided with fins, projections, prongs, etc.)
422	...Alloyed fuel	454	..With external fins, projections, prongs, etc.
423	..Moderator or reflector	455	.Hollow, annular, or graduated fuel layers or members (e.g., concentric, helical, etc.)
424	..Coolant or heat exchange material	456	.Vented fuel
425	..Heat insulating material	457	.Nonconventional jacket or can material
426	..Plural fuel segments or elements	458	MODERATOR OR REFLECTOR COMPONENT STRUCTURE FOR A FISSION REACTOR
427	..In solid moderator block	459	.With means for keying or assembling moderator blocks together
428	..Wherein the fissile content varies radially or axially within the same container (e.g., plural fuel layers)	460	ROTATING PLUG-TYPE COVER
429	..Complementary segments within same container	461	VESSEL SUPPORT (E.G., CORE VESSEL SUPPORTS)
430	..Spherically shaped segments within same container	462	GRIDS
431	..Concentric cylindrical elements	463	MISCELLANEOUS
432	..Plate-type fuel elements		
433	..Stacked (e.g., Candu type reactor fuel components)		
434	..In pack or bundle		
435	...Wherein the fissile content varies radially or axially across the pack or bundle		
436	...Wire-wrapped fuel elements		
437	...Having the fuel element ends positioned on or attached to rails		
438	...Including grid		
439	....With coolant flow path deflecting means		
440	....For ends of fuel elements		
441	....With nonintegral fuel element contacting means		
442	....With fuel element contacting protuberance or projection		
443	..With coolant flow path deflecting means		
444	....With coolant flow bypass means		
445	..With thermal expansion compensating means		
446	..With removable member		
447	..Including separate burnable poison or moderator		
448	...With means for spacing apart adjacent packs or bundles		
			<u>CROSS-REFERENCE ART COLLECTIONS</u>
		900	PARTICULAR MATERIAL OR MATERIAL SHAPES FOR FISSION REACTORS
		901	.Fuel
		902	..With external lubricating or absorbing material
		903	..Shapes
		904	.Moderator, reflector, or coolant materials
		905	..Organic
		906	..Metal
		907	..Dissociative coolants
		908	REACTOR GEOMETRY (OR PART THEREOF) DEFINED IN TERMS OF NUMERICAL VALUES
		909	MOBILE REACTORS
		910	ROTATING REACTORS
		911	PLURAL REACTOR SYSTEMS
		912	NUCLEAR REACTOR SYSTEMS SITUATED IN THE OCEAN

- 913 ANTIMATTER DEVICES AND METHODS
- 914 NUCLEAR EXPLOSIVES
- 915 FUSION REACTOR FUELS
- 916 METHODS OF MAKING FUSION FUEL
 TARGETS
- 917 UTILIZING DIFFERENT FUELS OR
 FUELS IN DIFFERENT FORMS, IN
 DIFFERENT REACTOR REGIONS IN
 RELATION TO AMOUNTS OF HEAT
 PRODUCED IN SAID REGIONS
- 918 ENTIRE REACTOR CORE OF SINGLE
 INTEGRAL STRUCTURE

FOREIGN ART COLLECTIONS

FOR CLASS-RELATED FOREIGN DOCUMENTS

